

## Materials Management and Safety

### Materials

In this unit, students will be comparing the weights of water and powdered drink mix before and after mixing them together. This unit is written so that students work in groups of four. Group size should be modified to fit your classroom and students.

In the unit, each group of four students will use a reusable drink container. The groups do not need to have identical containers. Small (150–400 ml) plastic containers work well. When gathering containers, make sure the weight of a container half-filled with prepared drink mix is not too heavy for the scales students will use. Transparent containers are better than opaque ones so students can see that the drink mix has dissolved in the water. Bottles sold for juicing and for use by runners are particularly light.

Powdered drink mix that contains sugar weighs more per volume than sugar-free drink mixes. The preparation directions in the unit were written using drink mix containing sugar. Mix that comes in a tub is more economical and, in areas where plastic recycling is possible, results in less waste than single-drink packets.

Students will need digital scales with at least 500 g capacity and readability of 0.1 g or 0.01 g. Scales with 1 g readability will work fine for the science content of the unit, but will not offer the opportunity for students to add, subtract, compare, and round decimals. It is best if each group of students has their own scale, but groups can share scales if needed.

Groups of two students will create computer programs in the final two tasks of the unit. For these tasks, student pairs (or larger groups) need access to laptop or desktop computers. Tablet or mobile devices with the Scratch app installed, although less optimal, will suffice. Modify group size based on the availability of computers and your students' experiences with programming while keeping the group size as small as possible. Scratch does not support shared editing, and research indicates that when working in groups one student may do the majority of the programming while others watch (18).

<b>Materials, in Order of Use</b>	<b>How Many?</b>
Powdered drink mix	140 g per group of four students plus 200 g for the teacher
Small containers with lids such as take-out salad dressing tubs	7 per group of four students plus 4 for the teacher
Digital scales	1 per group of four students
Plastic drink containers with lids	1 per group of four students plus 4 for the teacher
Water	
Backpack	1
Cell phone (optional)	1
Snack (optional)	1
Hiking trail map (optional)	1
Bird or plant identification book (optional)	1



Materials, in Order of Use	How Many?
Chart paper	
Large sticky notes	1 pack per group of four students
Safety goggles	1 per student
Funnels	1 per group of four students
Pitchers students can use to pour water into their drink containers	4 for the class
Large containers for collecting liquids	4 for the class or classroom sink
Materials for cleaning spills	
Writing paper	
Computer or tablet with Internet access	1 for the teacher 1 per group of two students (optional)
Projector for digital media	1

### Student Sheet Guidance

Distribution information for sheets students will need access to during the unit.

Sheet Name	Number of Copies
Initial Ideas About Drink Mixes	1 per student
Our Drink Mix Investigation Ideas	1 per group of four students
Investigation Procedure Test Run	1 per group of four students
My Claim About Drink Mix Weight	1 per student
Our Claim About Drink Mix Weight	1 per group of four students
Important Parts of the Story	1 per student
Storyboard Frame 1	Multiple per student
Storyboard Frame 2	Multiple per student
Storyboard Peer Review (optional)	1 per student
Animation Program Planning	1 per student

### Safety

Review drink mix labeling for allergy information.

Students should wear safety goggles when handling the powdered mix. Tell students that in the science setting they should not taste the powdered drink mix or the combined mix and water. Caution students to not touch their face with their hands while working with the powder or mixed beverages. Tell students to let you know if they get any of the powder in their eyes, nose, or mouth.

